DETECTOR LOGIC AND RADIO IDENTIFICATION DEVICE AND METHOD FOR ENHANCING TERMINAL OPERATIONS

[0001] This is a continuation of co-pending patent application Ser. No. 14/741,985 filed on Jun. 17, 2015 (hereby incorporated by reference) which is a continuation of patent application Ser. No. 10/592,811 filed on Jun. 2, 2008, now U.S. Pat. No. 9,084,116 (hereby incorporated by reference), which is the U.S. National Stage of International application number PCT/IB2004/000813 filed on Mar. 19, 2004 which was published in English on Oct. 6, 2005 under International Publication number WO 2005/093644.

FIELD OF THE INVENTION

[0002] The present invention relates to short-range communication systems, more particularly to improvements in RF-tagging communication systems, wherein the present invention provides means in a portable consumer electronic device to indirectly and internally utilize radio frequency identification (RFID) information stored in connection within the radio frequency identification (RFID) module to enhance and direct subsequent terminal operation.

BACKGROUND

[0003] Radio frequency identification (RFID) technology relates basically to the field of local communication technology and more particularly local communication technology involving electromagnetic and/or electrostatic coupling technology. Electromagnetic and/or electrostatic coupling is implemented in the radio frequency (RF) portion of the electromagnetic spectrum, using for example radio frequency identification (RFID) technology, which primarily includes radio frequency identification (RFID) transponders also denoted as radio frequency identification (RFID) tags and reader devices for radio frequency transponders also denoted for simplicity as radio frequency identification (RFID) readers.

[0004] Originally, radio frequency identification (RFID) technology has been developed and introduced for electronic article surveillance, article management purposes and logistics primarily for replacing bar code identification labels which are used for article management purposes and logistics up to now. A typical implementation of a state of the art radio frequency identification (RFID) transponder is shown with respect to FIG. **1**. A typical radio frequency identification (RFID) transponder module **10** includes conventionally an electronic circuit, depicted exemplary as transponder logic **11**, with data storage capacity, depicted herein as transponder memory **12**, and a radio frequency (RF) interface **235** and high frequency (HF) interface, respectively, which couples an antenna **13** to the transponder logic **11**. The radio frequency identification (RFID) transponders are typically accommodated in small containers. Depending on the requirements made on envisaged applications of the radio frequency identification (RFID) transponders (i.e. the data transmission rate, energy of the interrogation, transmission range etc.) different types are provided for data/information transmission at different radio frequencies within a range from several 10-100 kHz to some GHz (e.g. 134 kHz, 13.56 MHz, 860-928 MHz etc; only for illustration). Two main classes of radio frequency identification (RFID) transponders can be distinguished. Passive radio frequency identification (RFID) transponders are activated and energized by radio frequency identification (RFID) readers, which generate an interrogation signal, for example a radio frequency (RF) signal at a certain frequency. Active radio frequency identification (RFID) transponders comprise own power supplies such as batteries or accumulators for energizing.

[0005] On activation of a radio frequency identification (RFID) transponder by a radio frequency identification (RFID) reader, the informational contents stored in the transponder memory **12** are modulated onto a radio frequency (RF) signal, which is emitted by the antenna **13** of the radio frequency identification (RFID) transponder to be detected and received by the radio frequency identification (RFID) reader. Typical state of the art radio frequency identification (RFID) transponders correspond to radio frequency identification (RFID) standards such as the ISO 14443 type A standard or the Mifare standard. In accordance with the applicational purpose of a radio frequency identification (RFID) transponder, the information or data stored in the transponder memory may be either hard-coded or soft-coded. Hard-coded means that the information or data stored in the transponder memory **13** is predetermined and unmodifiable. Soft-coded means that the information or data stored in the transponder memory **13** is configurable by an external entity. The configuration of the transponder memory may be performed by a radio frequency (RF) signal via the antenna **13** or may be performed via a configuration interface, which allows for connection with the transponder memory **13**.

[0006] More particularly, in the case of a passive radio frequency identification (RFID) transponder (i.e., having no local power source), the radio frequency identification (RFID) transponder is conventionally energized by a time-varying electromagnetic radio frequency (RF) signal/wave generated by the interrogating radio frequency identification (RFID) reader. When the radio frequency (RF) field passes through the antenna coil associated with the radio frequency identification (RFID) transponder, a voltage is generated across the coil. This voltage is ultimately used to energize the radio frequency identification (RFID) transponder, and enables back transmission of information from the radio frequency identification (RFID) transponder to the radio frequency identification (RFID) reader, which is sometimes referred to as back-scattering.

[0007] Interest in various radio frequency (RF) tagging technologies has recently grown significantly resulting to development of various radio frequency (RF) tagging applications outside the conventional manufacturing line and electronic article surveillance applications.

[0008] As RF-tagging technologies are considered to become as one technology providing short-range interaction applications in the near future, especially in mobile communication environment, the basic nature of the RF-tagging technologies (passive communication, no means for "true" duplex data transfer) is becoming more of an issue to be considered in connection with applications relating to interactivity.

[0009] As soon as a portable device equipped with a radio frequency identification (RFID) transponder logic receives an interrogation signal upon entering into a coverage area of radio frequency identification (RFID) reader device, the radio frequency identification (RFID) transponder responds to the interrogation signal by back-transmitting of radio frequency (RF) signals embedding data stored in connection with the radio frequency identification (RFID) transponder.